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THE PLANT DISEASE REPORTER

Issued By

THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

AGRICULTURAL RESEARCH ADMINISTRATION

UNITED STATES DEPARTMENT OF AGRICULTURE

SUPPLEMENT 208

THE PLANT DISEASE WARNING SERVICE IN 1951

Supplement 208 December 15, 1951

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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THE PLANT DISEASE SURVEY
DIVISION OF MYCOLOGY AND DISEASE SURVEY

Plant Industry Station Beltsville, Maryland

THE PLANT DISEASE WARNING SERVICE IN 1951

Paul R. Miller and Muriel O'Brien

Plant Disease Reporter
Supplement 208 December 15, 1951

INTRODUCTION

Outstanding features of the 1951 season were a destructive epidemic of blue mold in Connecticut shade tobacco fields, and continuance of the northwestward advance of late blight as noted last year. In general, of the diseases handled under the Crop Plant Disease Forecasting Program, namely, late blight of potato and tomato (Phytophthora infestans (Mont.) D By.), tobacco blue mold (Peronospora tabacina Adam), and cucurbit downy mildew (Pseudoperonospora cubensis (Berk. & Curt.) Rostow.), late blight on both hosts was the most widespread and active in 1951. Cucurbit downy mildew and tobacco blue mold were negligible in incidence and spread, except for the Connecticut field outbreak of blue mold.

In the case of late blight, factors in its incidence and spread were its non-appearance in commercial greenwrap acreages planted with home-grown rather than out-of-state plants (Mississippi), the operation of good control programs when necessary, and the warm, dry weather in mid- to late season over the eastern portion of the United States. On the other hand, its widespread activity in the eastern Provinces of Canada was probably owing to the favorable weather conditions for blight development prevailing throughout that area this summer.

Concerning tobacco blue mold, absence of overwintering inoculum in certain areas prevented development of the disease. Adequate amounts of spray and dust materials were readily available and were utilized. Despite the above-normal January temperatures, light rainfall and average temperatures in the following spring months in tobacco-growing areas, together with control measures, held blue mold at a low level.

Cucurbit downy mildew was active this year in regions where it is endemic on squash and cucumbers. Cucurbit-growing areas of Texas escaped the disease this year owing to hot, dry weather conditions. A feature of downy mildew occurrence this year was the absence of its usual progressive northward development. The disease was found in one place in Virginia, was not noticed in Maryland or Delaware, but appeared in Pennsylvania.

PHYTOPHTHORA INFESTANS ON TOMATO:

Tomato late blight this year continued its northwestward movement across the upper tier of our States (Fig. 1). Although widespread acreages were affected, reduction in yields was low. Sources of infection included potato dump piles, nearby potato plants, airborne spores, southern transplants, and greenhouse plants. Along with the operation of good control programs, the hot, dry weather in mid- to late season helped check the further development of blight.

Fungicides used as sprays and dusts were effective in controlling the disease, especially when schedules were not interrupted by cold spells and where sufficient coverage was obtained. Losses in some cases would have been greater than in 1950 except for the fact that many canners and market gardeners used fungicides, the small growers showing interest in using large sprayers for better coverage. As listed in Table 1, products used included Dithane, Parzate, fixed coppers, Bordeaux mixture, nabam plus zinc sulfate, tribasic copper sulfate, zineb, Copper A, and carbamates.

PHYTOPHTHORA INFESTANS ON POTATO:

Figure 2 shows the wide distribution of potato late blight throughout the United States and the eastern Provinces of Canada. Blight on potatoes also continued its northwestward advance as noted in last year's summary. Estimated State averages of reduction in yield in infected acreages varied from 2 percent to as high as 50 percent tuber loss. Sources of inoculum included airborne sporangia, infected seed from the previous year, and nearby cull piles.

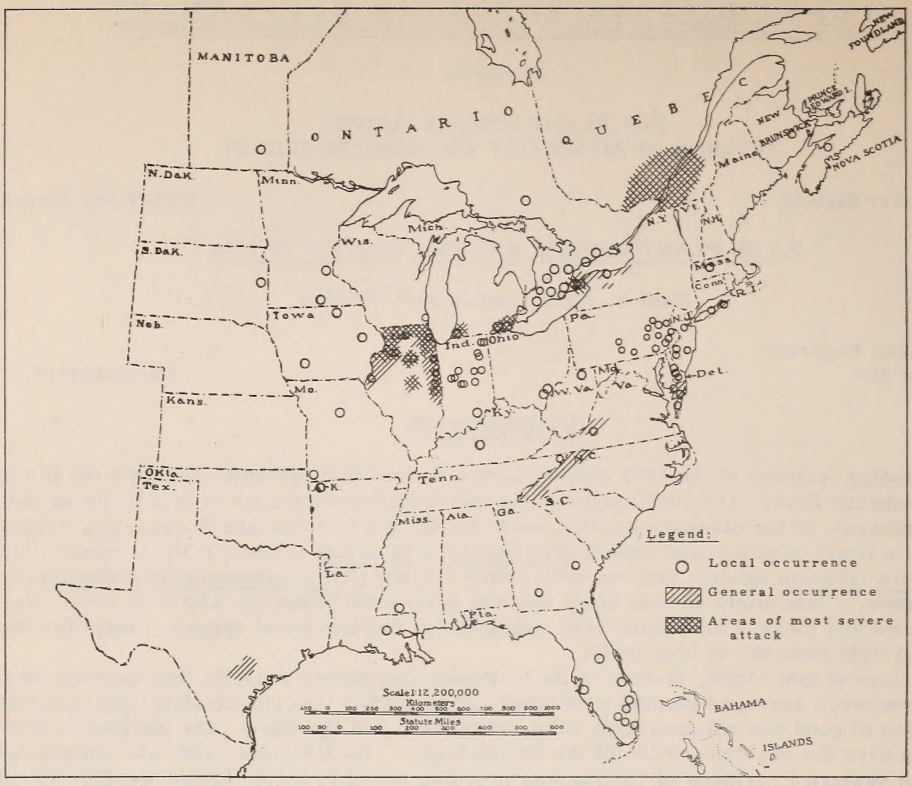


FIG. 1. DISTRIBUTION AND IMPORTANCE OF TOMATO LATE BLIGHT IN 1951.

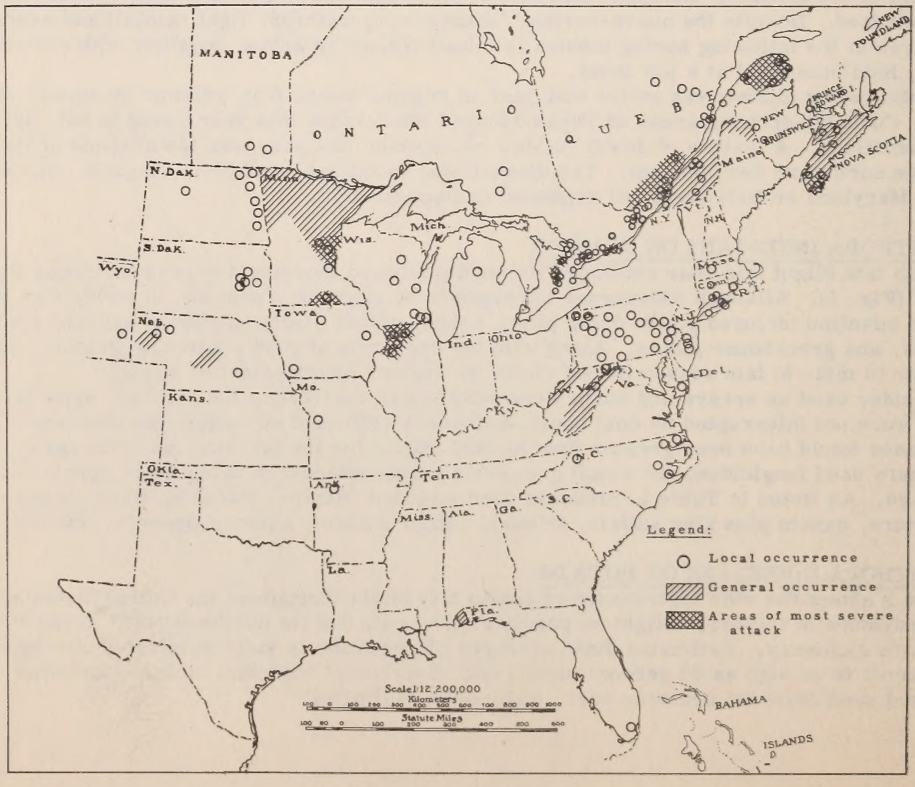


FIG. 2. DISTRIBUTION AND IMPORTANCE OF POTATO LATE BLIGHT IN 1951.

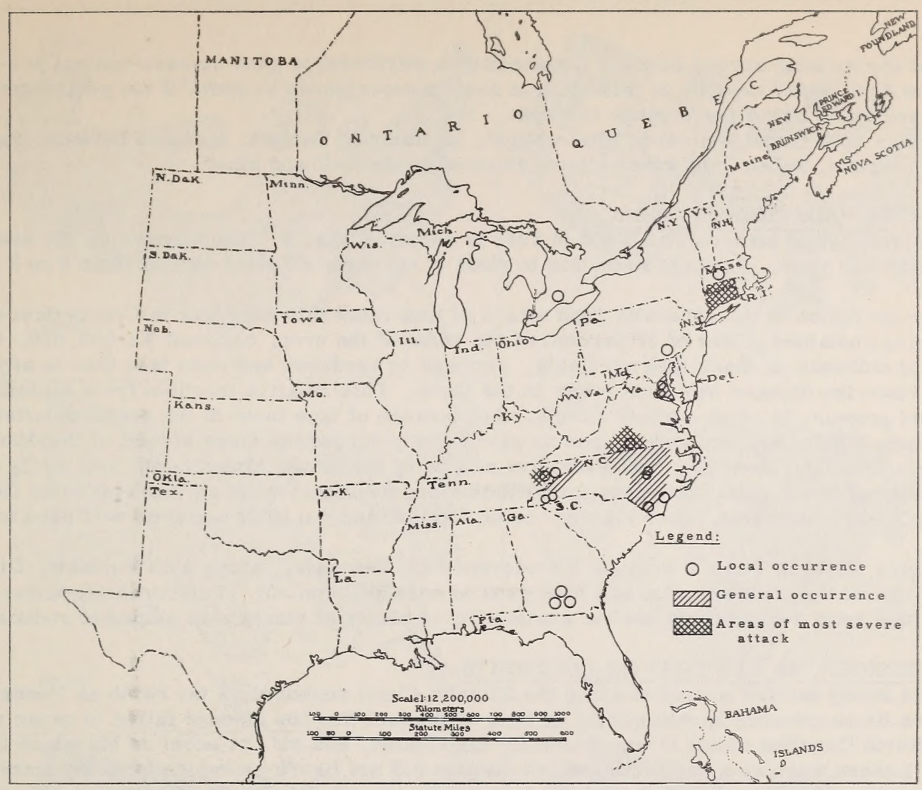


FIG. 3. DISTRIBUTION AND IMPORTANCE OF TOBACCO BLUE MOLD IN 1951.

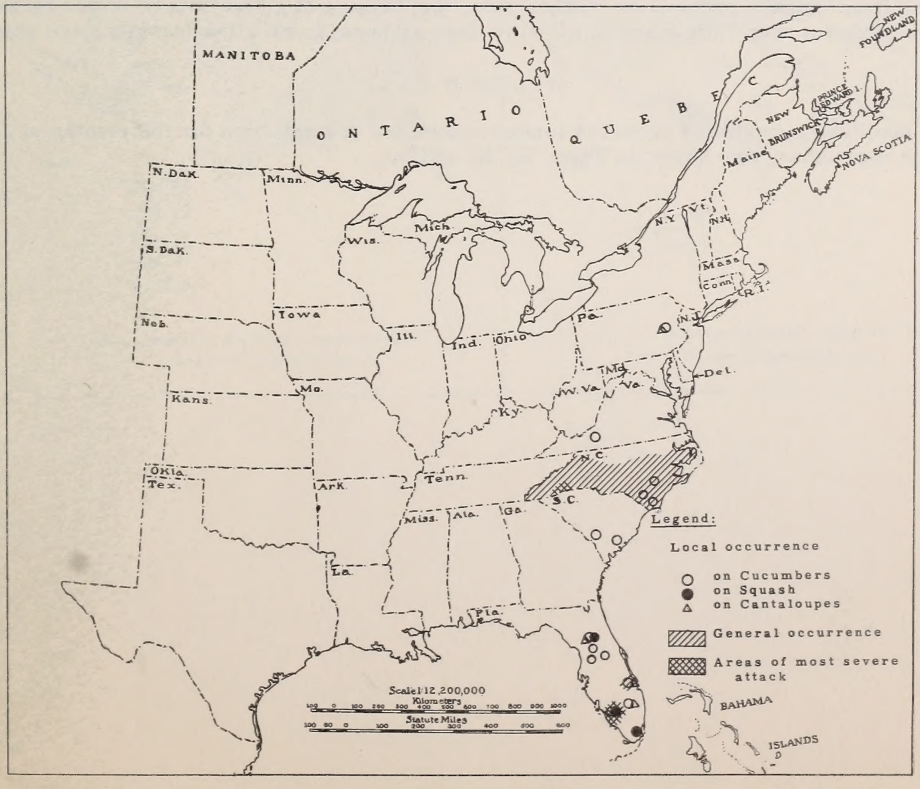


FIG. 4. DISTRIBUTION AND IMPORTANCE OF CUCURBIT DOWNY MILDEW IN 1951.

Lack of appreciable spread in many instances was attributed to good disease control programs. The dry, warm weather in mid- to late season experienced in some of the potato-growing areas also served to check the advance of blight.

Fungicides used in the control of potato blight, as listed in Table 2, included Dithane, Parzate, fixed coppers, nabam plus zinc sulfate, Bordeaux mixture, and zineb.

PERONOSPORA TABACINA ON TOBACCO:

The distribution of tobacco blue mold in 1951 is shown in Fig. 3. The disease on the whole was very light this year. Average reduction in yield of acreages affected ranged from 0 to 3 percent.

The one exception to the generally light attack of blue mold this year was in Connecticut where shade growers sustained a loss of 10 percent of the value of the crop, or about $2,000,000, from a devastating outbreak in shade tobacco fields. Damage to seedbeds had been less than in any other year since the disease was first found in the State. This relative freedom from disease undoubtedly led growers to relax control efforts. Appearance of blue mold in the seedbeds after plants had been set out was not looked upon as particularly dangerous since spread of the disease to the field is unusual. However, this extensive source of inoculum, plus a cool, wet, early summer, evidently afforded ideal conditions for initiation and development of an unprecedented field epidemic. Control programs, when started, came too late and too little material was used to be effective.

Fungicides listed in Table 3 indicate a preference for Fermate. Along with Fermate, Dithane Z-78, Parzate, and zineb also afforded good to excellent control. Unfavorable weather conditions for blue mold development and the availability of plenty of plants also helped to reduce loss.

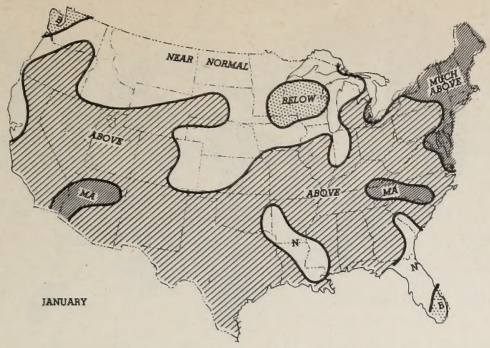
PSEUDOPERONOSPORA CUBENSIS ON CUCURBITS:

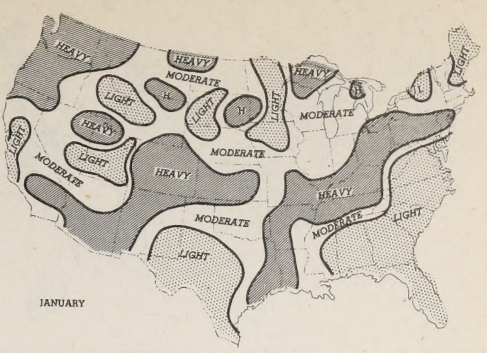
Cucurbit downy mildew occurred along the Atlantic Coast seaboard as far north as Pennsylvania, where its occurrence is noteworthy in view of the fact that the disease failed to cause much damage in North Carolina where it was generally distributed, and did not occur in Maryland and Delaware. Losses were at a minimum and the disease did not figure prominently in the disease picture this year. Weather conditions in some instances were not favorable for disease development; or it appeared late, causing only slight injury. Fig. 4.

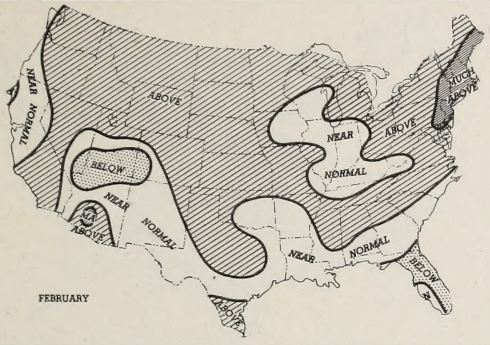
Fungicides used in controlling cucurbit downy mildew, Table 4, included zineb, nabam plus zinc sulfate, fixed copper, and ziram. Only a small percentage of growers use control measures but where nabam plus zinc sulfate and zineb were used as sprays, excellent results were obtained.

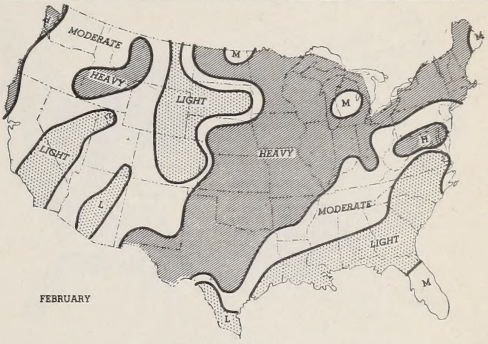
WEATHER

Maps, showing approximate observed temperatures and precipitation for the months of January through September, are shown in Figs. 5a, b, and c.









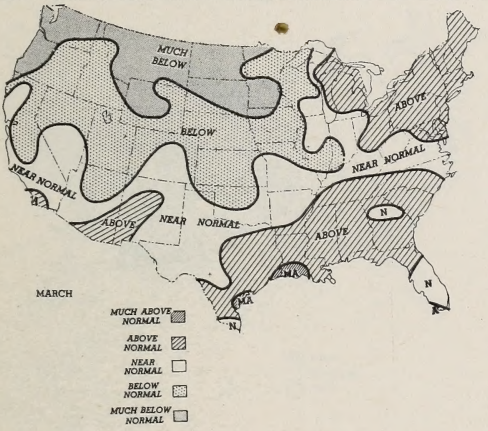
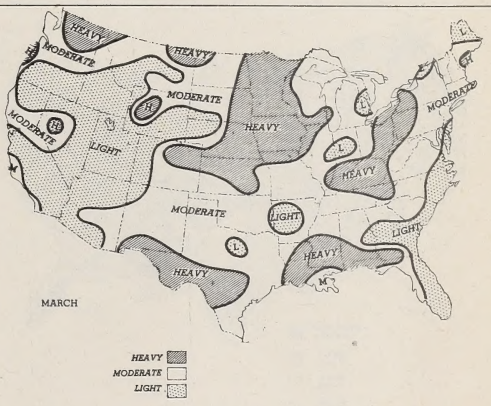
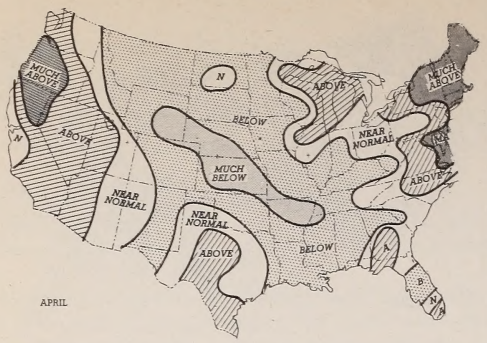
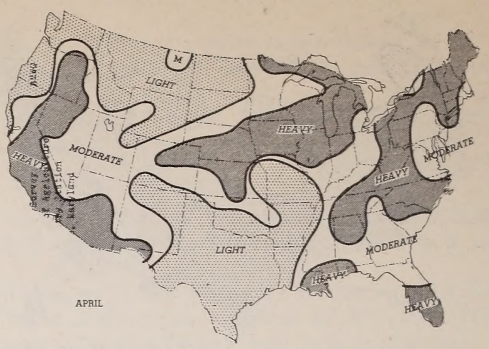


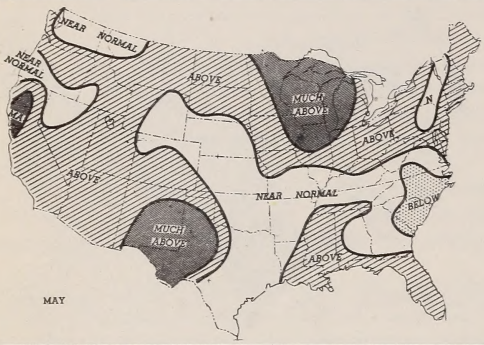
Fig. 5a. APPROXIMATE OBSERVED TEMPERATURE - JANUARY through MARCH, 1951.

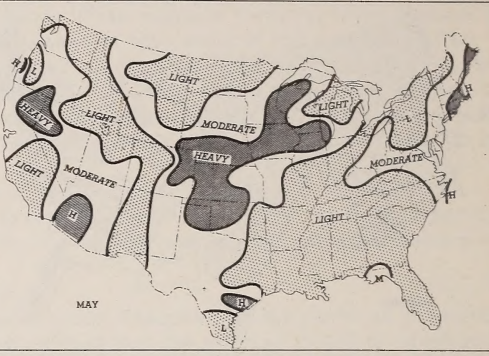


APPROXIMATE OBSERVED PRECIPITATION - JANUARY through MARCH, 1951









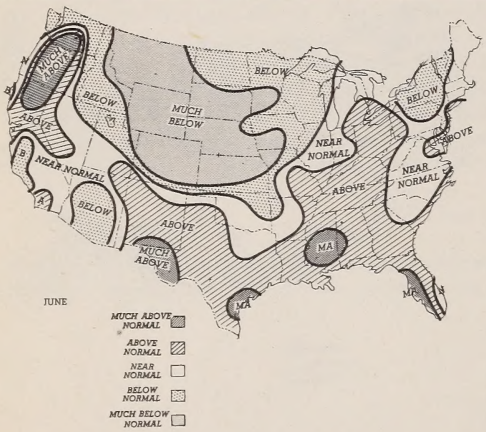
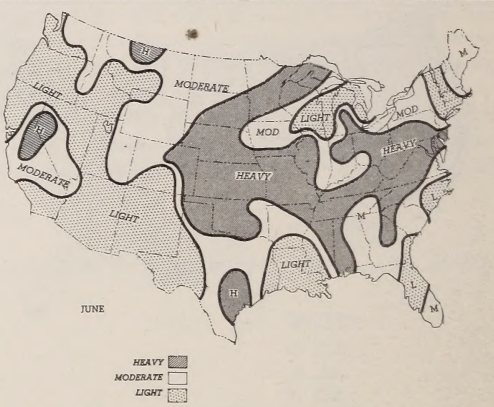
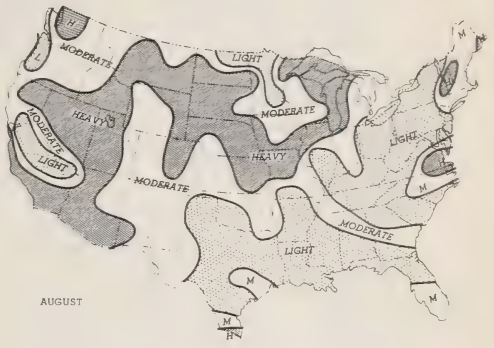


Fig. 5b. APPROXIMATE OBSERVED TEMPERATURE - APRIL through JUNE, 1951



APPROXIMATE OBSERVED PRECIPITATION - APRIL through JUNE, 1951



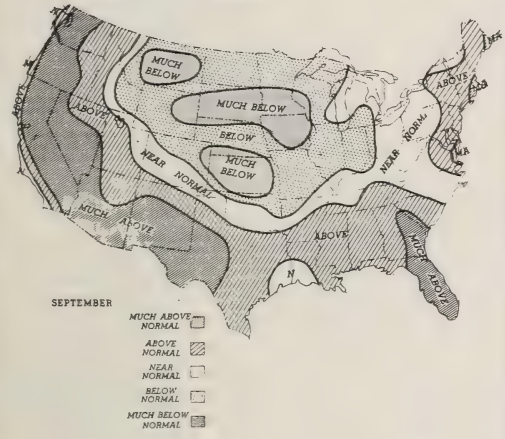
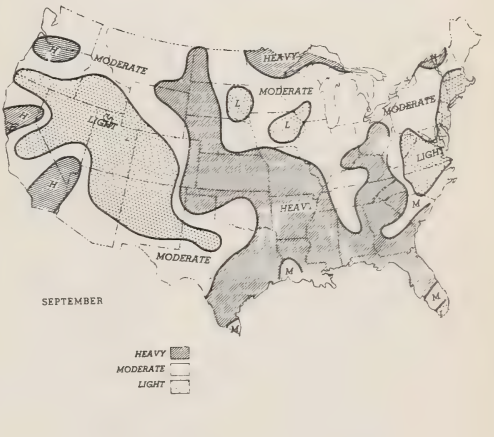


Fig. 5c., APPROXIMATE OBSERVED TEMPERATURE - JULY through SEPTEMBER, 1951.



APPROXIMATE OBSERVED PRECIPITATION - JULY through SEPTEMBER, 1951.

Table 1. CONTROL OF LATE BLIGHT ON TOMATO: Materials used as Sprays and Dusts and their effectiveness, 1951.

State or Province	Materials	Concentration	Percent growers using	Results	Remarks
SPRAYS:					
Ala.	Nabam	2 qts. - 3/4 lb. $ZnSO_4$-100	1		No late blight present.
	Zineb concentrate	2 lbs.-100 gals.	.05		
Conn.	COCS	4-100	Unknown	All gave good control	Owing to press, radio, and personal warnings, most growers applied control earlier and more often.
	Tribasic	"	"		
	Copper A	"	"		
	Bordeaux	"	"		
Del.	Zineb	2 qts.-1-100 or 2-100	80	Good all season	The disease was of little consequence in the commercial canning crop. It damaged some late open-market fields.
	Tribasic	3-100	30	Good (August application only)	
	Bordeaux	6-3-100	30	Good (August application only)	
Fla. (Dade Co.)	Nabam + $ZnSO_4$	2-1-100	80	Good to excellent	Since blight appeared in seedbeds at transplanting time, it was in some cases carried to the field causing poor stands, necessity of replanting in a few cases. Thirteen cold spells interrupted spray schedules.
	Zineb	2-100	20	" " "	
Ill.	Dithane D-14 + $ZnSO_4$	2 qts.-1 lb.-100	70	Where fungicides were applied before late blight became too severe, all materials gave good to excellent control with the exception of Zerlate.	
	Zerlate	2 lbs.-100			
	Fixed coppers	4 lbs.-100			
	Parzate (dry)	2 lbs.-100			
	Dithane Z-78	2 lbs.-100			
	Bordeaux mixture	?			
Md.	Z-Z-T-T-T	2 lbs.& 4 lbs.-100 gal.	50	Good	Dry weather during mid- and late season retarded disease development.
	Dithane Z-78	2 lbs.-100 gal.	25	Good	
	Dithane D-14 + $ZnSO_4$	2 qts.-1 lb.-100 gal.	25	Good	
Mich.	Alternating copper and zerlate	Usual		Good	
	Tank mix copper and zerlate	"		Good	
	Dithane	"		Good in southeastern area; poor in southwestern	

Table 1. (Continued)

State or Province	Materials	Concentration	Percent growers using	Results	Remarks
SPRAYS: (Cont.)					
Miss.	Copper A Parzate Tribasic C.S. Dithane Z-78	4-100 2-100 4-100	85		Control measures used by growers in Copiah, Lincoln and Hinds Counties; greenwrap acreage very low, hence high percentage of growers using sprays and dusts.
N. H.	Neutral copper		Very few	Fair	No commercial acreage. Home gardeners suffered heavy losses; very few attempted to control the disease.
N. Y.	Zerlate - bordo Zineb	2, 8-4-100 2-1-100	70-80 10-15	Excellent Excellent in 1951	
N. C.	Fixed coppers Carbamates	2 lbs./100 2/100	15 5	Good Fair	
Pa.	Fixed copper Bordeaux Zineb	 4 lbs. of 50% 6-3-100 8-4-100	Est. 70 15	 Very good Excellent	To control other diseases most growers use ziram either in early sprays combined with fixed copper or in alternating sprays.
			5	Good	
S. C.	Nabam	2-1-100	3	No disease	
Va.	Copper Zineb	2 lbs.-100 gal. 1 1/2 lbs. -100 gal.	10 1	Not enough late blight to judge efficacy of sprays.	Late blight started in eastern and southwestern Virginia but the weather conditions became unfavorable for blight which caused very little damage.
W. Va.	Zineb Bordeaux mixture Fixed coppers	2 1/2 lb.-100 8-8-100 2 lb. -100	10 10 10	Excellent Good Good	
Wis.	Copper A Carbamates	6 lb. -100 gal. 2-3 qts. -100 gal.	75 Very few	Poor ?	
DUSTS:					
Ala.	Zineb Tribasic copper	6% 6%	33 12		

Table 1. (Continued)

State or Province	Materials	Concentration	Percent growers using	Results	Remarks
DUSTS: (Cont.)					
Ark.	Tribasic copper sulfate	7% Cu.	Less than 1	No blight where used.	
	Dithane Z-78	6%	Less than 1	" " "	
Conn.	Fixed copper	8% Cu.	?	Fair control until late Sept. when dusting was stopped	
Del.	Tribasic		10	Fair	Disease was of little consequence in the commercial canning crop. Damaged some late open-market fields.
	Zineb		10	Fair	
Ill.	Fixed coppers	7% Cu.	6% where dusting service available	See Remarks under Sprays	
Md.	Ziram	10%		Fair	Dry weather during mid- and late season retarded disease development.
	Fixed copper	7%			
Mich.	Tribasic copper			Good	
Miss.	Copper A	12%			See Remarks under Sprays
	Parzate	"			
	Tribasic copper sulfate	"			
	Dithane Z-78	"			
N. C.	Fixed coppers	7% Metallic Cu.	75	Good	
	Carbamates	6% active	5	Fair	
N. H.	Neutral copper		Very few	Fair	No commercial acreage
N. Y.	Zerlate - copper	10% - 7%	5	Poor	
Pa.	Fixed copper	7%	10	Fairly good	
S. C.	Fixed copper	6-6 1/2% Cu.	50		State recommendations - copper with zineb or nabam as alternates.
Va.	Copper	6%	Few		Not enough late blight to judge effectiveness of control.

Table 1. (Continued)

State or Province	Materials	Concentration	Percent growers using	Results	Remarks
DUSTS: (Cont.)					
W. Va.	Zineb	6 1/2%	15	Excellent	
	Fixed coppers	6 - 7%	20	Good	
	Copper-lime	20-80	10	Good	
Wis.	Copper	7%	10	Poor	

Table 2. CONTROL OF LATE BLIGHT ON POTATO: Materials used as Sprays and Dusts and their effectiveness, 1951

State or Province	Materials	Concentration	Percent growers using	Results	Remarks
SPRAYS:					
Fla. (Dade Co.)	Nabam + Zinc sulfate	2-1-100	100	Excellent	Frequent cold "spells" interrupted regular spray.
Minn.	Dithane & Parzate coppers		95	Poor to good	Results depended on care in application and weather.
Nebr.	Dithane		2	Good	
	Parzate		1	"	
	Fixed copper		1	"	
N. H.	Neutral copper	6 lbs.-100 gal.	45	Good-	Home gardeners suffered heavy losses. Commercial growers did a fairly good job of controlling late blight. Kennebec acreage was fairly large and stood up well.
	Dithane, Parzate		5	Good	
Pa.	Zineb	2 qts. liquid + 1 lb. zinc sulfate	60	Good through season; not up to copper at end for storage rot	Ninety-nine percent+ of commercial growers use control measures.
	Bordeaux	8-4-100	40	Good in all stages	
	Fixed copper	4 lbs. of 50%	10	Good	
	Crag 658	2 lbs.	Few	Good	
S. C.	Nabam	2-1-100	1		No disease.
W. Va.	Zineb	2 1/2 lbs.-100	5	Excellent	
	Bordeaux mixture	8-8-100	10	Good	
	Fixed coppers	2 lbs.-100	5	Good	
Wis.	Carbamates	2 qts.-100-1 acre	?	Excellent to good	
	Copper (fixed)	4-6 lbs.-100-1 acre	?	Excellent to good	
	Bordeaux	8-10 lbs.5-6 lbs.-100 gals.	?	Excellent to good	
	Copper zinc chromate	2 lbs.-100-1 acre	?	Poor when 2 lbs. per 100 gal. used; 3-4 lbs. may give good control.	
Canada (Eastern Ontario)	Bordeaux mixture	4-2-100	83	Good	Late blight appeared early and spread somewhat slowly being severe in unsprayed and poorly sprayed fields, making conditions favorable for tuber infection. Blight appeared on potatoes one month earlier than tomatoes.
	Dithane	2-100	2	Poor to good	
	Fixed coppers	Various	3	Poor to good	

Table 2. (Continued)

State or Province	Materials	Concentration	Percent growers using	Results	Remarks
SPRAYS: (Cont.)					
(Prince Edward Island)	Bordeaux	80-4-80	65	Good to excellent	
	Dithane D-14	2 qts.-1 Zn-80	10	Good to excellent	
	Neutral coppers		10	Good	
DUSTS					
Minn.	Dithane, Parzate Fixed coppers		95	Poor to good Depending on care in application and weather.	
Nebr.	Dithane		1	Fair	
N. H.	Neutral copper	7% Cu.	45	Good	
Pa.	Copper	20-80%	Few		
S. C.	Fixed copper	6-6 1/2% Cu.	50		
	Zineb	4%	5		
W. Va.	Zineb	6 1/2%	15	Excellent	
	Fixed coppers	7%	20	Good	
	Copper-lime	20-80%	5	Good	
Wis.	Copper	7%			Very little used. About one-half dozen growers in Antigo area dusted with plane once or twice in addition to regular spray program. A few growers in southern and southeastern portion of State also used dust.
Canada (Eastern Ontario)	Fixed coppers	Various	2	Poor to good	
(Prince Edward Island)	Dithane Z-78		1	Poor	
	Coppers		2	Poor	

Table 3. CONTROL OF BLUE MOLD OF TOBACCO: Materials used as Sprays and Dusts and their effectiveness, 1951.

State or Province	Materials	Concentration	Percent growers using	Results	Remarks
SPRAYS:					
Md.	Fermate	2-100	50	Good	Hot, dry weather starting soon after initial infection stopped the disease and prevented serious losses.
N. C.	Fermate	4-100	27	Good	The attack of blue mold was later than usual; in the Border Belt most of the crop was set before blue mold became active. Elsewhere the disease became destructive just prior to and during the transplanting season on non-treated beds. Where the disease was severe, plants were not killed but transplanting was delayed.
	Dithane Z-78 or Parzate	3-100	3		
Tenn.	Ferbam	76% material, using 5 tablespoons/gallon	Est. 20	Good	
	Zineb	65% material, 2 1/2 tablespoons/gallon	Very few		
	Fermate	4 lbs.-100 gal.	40	Excellent	
	Dithane	3 lbs.-100 gal.	5	Good	
Va.	Ferbam	3-4 lb.-100 gal.	75	Excellent	Weather conditions mostly favorable for control of the disease; plenty of plants.
	Zineb	2 lbs.-100 gal.	Few	"	
DUSTS:					
Fla.	Ferbam	15.6%	40	Good	Excellence of results with zineb probably due to better coverage. Dusts applied 3 times a week using from 15 to 35 lbs. per acre depending on size of plants.
	Zineb	6.5%	40	Excellent	
Md.	Fermate	15%	50	Good	See Remarks under Sprays.
N. C.	Fermate	15%	30	Good	See Remarks under Sprays.
	Dithane Z-78 or Parzate	10%	5	Good	
Tenn.	Ferbam	10%	15	Good	
	Zineb	5%	15	Good	
	Fermate	10%	25	Excellent	
	Dithane	5%	5	Good	
Va.	Ferbam	10%	15	Excellent	Weather conditions mostly favorable for control of blue mold; plenty of plants.
	Zineb	6%	Few	"	

Table 4. CONTROL OF DOWNY MILDEW OF CUCURBITS: Materials used as Sprays and Dusts and their effectiveness, 1951.

State or Province	Materials	Concentration	Percent growers using	Results	Remarks
SPRAYS					
Fla.	Nabam + zinc sulfate	2-1-100		Excellent	Only a few farmers spray squash; with increased yields and good control, this number is increasing.
	Zineb	2-100		"	
S. C.	Nabam	2-1-100	5		Disease appeared after fungicide application stopped.
Va.	Copper	1 1/2 lb.-100	Few		Only a few growers used control measures. Weather conditions were not favorable for disease. Mildew appeared late and caused slight injury.
	Zineb	1 lb.-100	"		
DUSTS					
N. C.	Fixed copper (Tribasic)	5%	15	Poor to good	
	Carbamates	6%	2	Poor to fair	
S. C.	Fixed copper		38	Disease appeared late after dusting and spraying stopped and when harvest completed.	Recommendations: Copper (1st) zineb or nabam or ziram (2nd).
	Zineb		30		
	Ziram		2		
Va.	Copper	5%	Few		Only a few growers used control measures. Weather conditions were not favorable for disease. Mildew appeared late and caused slight injury.
	Zineb	6%	"		

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